



Idaho National Engineering & Environmental Laboratory

PROJECT DOCUMENT REVIEW RECORD

DOCUMENT TITLE/DESCRIPTION: COMPREHENSIVE REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR
WASTE AREA GROUP 6 AND 10 OPERABLE UNIT 10-04 (Draft)

DATE: May 04, 2001 **REVIEWER:** EPA Region 10

ITEM NUMBER	SECTION NUMBER	PAGE NUMBER	COMMENT	RESOLUTION
GENERAL COMMENTS (HUMAN HEALTH)				
1			Sections describing nature and extent of contamination (e.g. 7.1.3 for BORAX-02) list maximum detection levels for contaminants. They should also list the value used in the risk calculation (i.e. the exposure point concentration used) for those contaminants which are risk drivers.	Comment incorporated. All nature and extent sections in the RI listing maximum detection levels now also include the exposure point concentrations for contaminants retained in the HHRA or ERA.
2			Noncarcinogenic compound screening. When screening multiple noncarcinogenic contaminants, an RBC corresponding to a target HI of 0.1 is often used (e.g. EPA Region III RBC guidance). This procedure was not carried out for the screening process used in this RI to eliminate COPCs. The basis for the screening should be reevaluated.	Comment incorporated. We conducted a sensitivity study on all COPCs for WAG 6 and 10 sites. The contaminants were evaluated again in an additional screening at 1 tenth of the RBC. This additional HHRA screen can be found in Appendix C.
3			RBC values. 4-amino-2,6-dinitrotoluene was a contaminant detected in soil samples for several sites involved in this RI. Tables listing the soil contaminant screening process state that there is no RBC for this compound. The EPA Region III RBC table lists an RBC for aminodinitrotoluenes of 4.7 mg/kg. All screening tables should be reviewed (e.g. the Experimental Field Station and other sites found in Chapter 12.) And updated as appropriate.	Comment incorporated. All screening tables including either 2-amino-4,6-dinitrotoluene or 4-amino-2,6-dinitrotoluene have been updated to reflect the aminodinitrotoluenes RBC value of 4.7 mg/kg from Region III. All changes correlating to the updated tables have been incorporated into the needed sections or appendices.



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4			Dermal Exposure Methodology. The dermal absorption pathway is evaluated only for organic contaminants and arsenic. The statement is made in Section D-1.1.3.1.3 that "EPA 1999 REGION IX PRG MEMORANDUM does not recommend the use of assumed or default absorption (ABS) values for volatile or inorganic contaminant." A qualitative discussion of the impact of not evaluating dermal risks from volatile or inorganic contaminants should be included in the Uncertainties Sections of affected risk assessments.	<p>Comment incorporated. A discussion of the impact of not evaluating dermal risks from volatile or inorganic contaminants was included in the Uncertainties Sections of affected risk assessments. This discussion was also added to the uncertainty section of Appendix D, where there is a more in-depth discussion of the HHRA uncertainties.</p> <p>A general statement was also added to the uncertainty sections of all sites evaluating COPCs in a HHRA or an ERA as to where the uncertainties in risk assessments can be found. This was done to limit the repetitiveness of including all uncertainties over- or underestimating risk under every section and to save the uncertainty section for only specific uncertainties relating to that site or area.</p>



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5			Lead Exposure Assessment Methodology. Throughout the RI/FS, lead exposure was not calculated for either future residents, current occupational workers or future occupational workers because cancer slope factors are not available for lead. Lead exposure models are available for estimating risks from lead exposure to soil and household dust. The Integrated Exposure Uptake Biokinetic (IEUBK) Model for evaluating lead exposure in children is one example. Additionally, EPA's Technical Review Workgroup (TRW) published methodology in "Recommendations of the Technical Review Workgroup for Lead, an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil", December 1996. The adult lead model is available for estimating adult risks associated with exposure to lead in soil. In this case, it may not be reasonable to evaluate the lead exposures since remedial actions for lead are being proposed based on exceedances of the lead screening value. However, these tools should be considered for use in future risk assessments.	Comment noted. A statement was added to section 14 explaining why the IEUBK model was not used and lead was screened based on the lead screening level.
6			Averaging Times. Averaging times for carcinogenic risk calculations were utilized in all risk assessments for the future residential receptor. According to the Exposure Parameters tables found in Appendix E, the averaging time used was 24,500 days. The 70 year (365 d/year) carcinogenic risk averaging time is 25,550 days. Appendix E should clarify that the averaging time is based on 350 d/year exposure.	Comment incorporated. Appendix E now clarifies that the averaging time is based on a 350 d/year exposure.
7			Toxicity data. Toxicity data for COPCs are not presented within the text of the document or the Appendices containing the risk calculation tables. This information is needed to verify hazard quotient and cancer risk calculations. Summary tables similar to RAGS D Tables 5 and 6 format would be useful.	Comment incorporated. Toxicity data for COPCs are now presented in a table similar to the suggested RAGS D Tables 5 and 6 (as far as the data was available). This table was included as an attachment (E4) to Appendix E.



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8			The format of the risk tables in Appendix E is difficult to follow. Several pages within Appendix E are either not numbered, or have the same number as risk tables for other receptors or sites. The receptor and site name should be presented on each table, as opposed to at the beginning of the section for the future occupational receptor or future resident. In addition, all cells with "0.00+00" should be replaced with a footnote indicating why cancer risks, hazard indices, or intakes were not calculated for the specific compound. The "0.00+00" implies that there is zero risk associated with the chemical or pathway.	<p>Comment incorporated. A table of contents has been added to Appendix E to help the reader follow the sequence of risk tables.</p> <p>The receptor is now included in the title of each table presented and the site names are presented within the headings or the left-hand column of the tables.</p> <p>All zeros were taken out of the risk calculation tables, and several footnotes explaining results or limitations are now included to help clarify the tables.</p>
9			The human health risk assessment Uncertainties Sections throughout the RI should be expanded. These sections should define all potentials for underestimation or overestimation of risks. Appendix A of the Guidance Protocol for the Performance of Cumulative Risk Assessments at the INEL, provides an example of a qualitative uncertainty analysis to be performed.	<p>Comment incorporated. Only information relating to specific uncertainties of a site was included within that site's uncertainty section. This was done to limit the amount of repetitiveness found within each uncertainty section.</p> <p>A statement was added to each uncertainty section to direct the reader to the section or appendix discussing the more general uncertainties relating to that site.</p> <p>A more in-depth discussion of the uncertainties related to the HHRA was included in Section 4 and Appendix D along with a table presenting all the potentials for underestimation or overestimation of risks.</p>



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GENERAL COMMENTS (ECOLOGICAL)				
10			<p>The OU 10-04 ERA lacks focus and does not appear to achieve its goals of (1) quantitatively evaluating the sampling performed in 1997 and 2000, (2) clearly defining the COPC list on a site-wide basis, or (3) summarizing the risk to ecological receptors on a site-wide basis. The OU 10-04 ERA concludes that there is "de minimus risk to the INEEL plant communities, terrestrial wildlife communities, species of concern, soil fauna, game species, and prey base". This conclusion does not appear to be adequately supported. This conclusion is primarily based on the relative risk evaluation and the habitat loss analysis. The relative risk evaluation lacks clear presentation of steps and data and is not sufficiently supported by information in the Section 17 text or appendices. The habitat loss endpoint does not incorporate potential toxicological effects from contaminants of concern. As part of summarizing the risk to ecological receptors on a site-wide basis, the OU 10-04 ERA should identify which WAG contaminants resulted in the highest WAG specific HQ calculations, whether the contaminants yielding the highest HQs are bioaccumulative, whether certain receptors consistently have the highest HQs, which WAGs have been remediated, residual contamination levels, and the spatial extent of contamination.</p>	<p>We have added additional organizational work to Section 17 and added graphics to improve the focus. Specifically, as discussed in this comment: although the sampling was quantitatively evaluated in the ERA, this was obviously not clear and has since been corrected. The COPCs have been brought into the risk characterization section and discussed. A lines-of-evidence table has been included in the risk characterization section.</p> <p>An additional discussion clarifying the rationale for eliminating additional COPCs has been added. The WAG ERA results have been discussed more completely as suggested. The sites of concern from the WAG ERAs and the associated COPCs have been discussed more completely.</p> <p>Two tables have been added to the risk characterization section. One ties these endpoints to the information available that supports the risk conclusion. This table addresses each of the endpoints outlined in Table H6-2. The other table is a lines-of-evidence which assesses all available and pertinent information to support the risk conclusions and recommendations.</p>



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11			The ecological risk conclusions discuss one measurement endpoint, the loss of habitat. Table H6-2 within Appendix H6 of this RI document lists assessment endpoints, receptors, measures of exposure, measures of effects and additional lines of evidence that should have been considered in the risk characterization.	See comment # 10.
12			For example, the assessment endpoint number 6, De minimis risk to INEEL prey base (e.g. Nuttall's cottontail, montane vole, horned lark, beetles, grasshoppers) was to be measured through evaluation of COPC concentrations in soil, surface water, beetles, grasshoppers, and plant tissue, modeled COPC concentrations in upper trophic level receptors and calculation of HQs. Biotic and abiotic sampling was performed in order to evaluate COPC concentrations in soil, grasshoppers, and plant tissue. Hazard quotients should have been calculated for the OU-10-04 refined list of COPCs using refined exposure parameters. Exposure parameter refinement should include the use of the collected tissue data. The results from the calculation of HQs and interpretation of additional lines of evidence should be presented in the OU-10-04 ERA conclusions as an evaluation of risk to the prey base. Each of the assessment endpoints outlined in Appendix H6 should be addressed in the OU-10-04 ERA conclusions.	<p>For the first part of this comment, it had been previously decided by the agencies that the WAG ERAs would not be reevaluated using site-specific or updated exposure parameters. The WAG ERA results remain as per their respective comprehensive RI/FS.</p> <p>The OU 10-04 ERA and WAG 6 & 10 sites used parameters as previously developed from the literature to allow consistency between risk assessment results.</p> <p>Additionally there were significant problems with the detection limits for the soils the ERA sampling data available was questionable for some COPCs. However, this data has been evaluated and a sensitivity analysis has been performed and is now included in the assessment. This has been compared to the WAG ERA summary, the OU 10-04 data, and the WAG 6 & 10 ERA results.</p> <p>The assessment endpoints outlined have been addressed as discussed in the resolution to Comment # 10.</p>



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13			The OU 10-04 ERA refined the list of contaminants of concern generated from WAG specific screening ecological risk assessments as is appropriate. However, the steps of this refinement is not clear. Appendix H2 of this RI document entitled "Refining Preliminary Contaminants of Ecological Concern for OU 10-04 Site Wide Ecological Risk Assessment", identifies COPCs based on an HQ exceedance of one. These COPCs are presented in Table 17-1. Then a spatial evaluation of receptor exposure, as presented in Appendix H9 is performed. It is stated on page 17-37 that this Appendix H9 evaluation reduced the COPC list, but does not specify which COPCs were eliminated due to the spatial evaluation of receptor exposure. Then, additional COPCs are eliminated based on a threshold of HQs at or below 30. Apparently, the maximum HQs listed in tables within Appendices A and B within Appendix H2 were used for this additional COPC refinement with results presented in Table 17-17. COPCs such as strontium, Aroclor 1260, and HMX were eliminated as COPCs; however, it is not clear whether they were eliminated because of the spatial evaluation or because of HQs being below 30. The elimination of COPCs per step needs to be clearly presented.	Section 17 has undergone a considerable reorganization for clarity. The tables in Section 17 and appendices H2 and H1 have been reviewed for clarity. In addition, a separate discussion regarding the rationale for eliminating COPCs with HQs less than or equal to 50 is presented in Appendix H2.
14			1,3-Dinitrobenzene and 2,4-Dinitrotoluene were eliminated as COPCs in Appendix H2 but are presented in Table 17-17 as COPCs. The elimination of 1,3-Dinitrobenzene, 2,4-Dinitrotoluene, and 2,4,6-Trinitrotoluene appears erroneous considering HQs of 4,000 and 10,000 were calculated in WAG specific ERAs.	Comment incorporated. The compounds 1,3-dinitrobenzene 2,4-dinitrotoluene, and 2,4,6-TNT were retained as COPCs for the OU 10-04 RI/FS. The text and tables in appendices H1 and H2 have been revised to address this discrepancy. The tables in Section 17 have also been revised to include these COPCs.



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15			The lists of COPCs presented in Tables 17-3 through 17-9 are not consistent with the COPCs in Appendix H2. There are more COPCs listed for evaluation in the OU 10-04 ERA within Tables 17-3 through 17-9 than the COPCs recommended for evaluation in the OU 10-04 ERA in Appendix H2. A summary of sites and COPCs retained for evaluation in the OU 10-04 ERA is presented in Section 18, the RI/BRA Summary and Conclusions which lists different COPCs than Tables 17-3 through 17-9. For clarity, the steps of the COPC refinement and associated tables should be clearly presented in one place with one list of OU 10-04 ERA COPCs identified in the OU 10-04 ERA Section 17.	Comment incorporated. Comment incorporated. The tables and text in appendices H1 and H2 and Section 17 have been revised for clarity. Further discussion pertaining to the evaluation of COPCs has been added to Section 17.
16			Site-specific bioconcentration and bioaccumulation factors were not derived even though tissue residue data were collected (e.g., grasshopper, deer mice, cottontail and wheatgrass). EPA Region 10 Supplemental Risk Assessment Guidance for Superfund (1997) indicates on page 37 a preference for derivation of site-specific bioconcentration and bioaccumulation factors. Calculation of site specific bioaccumulation factors should be useful in reducing the uncertainty in the ecological risk results.	It had been previously decided that the WAG ERAs would not be re-evaluated using site-specific BAFs (and PUFs). It was also decided that the OU 10-04 ERA and WAG 6 & 10 sites would also BAFs (and PUFs) as previously developed from the literature. This would allow the OU 10-04 Site-wide risk assessment to be more directly comparable to past ERAs performed. Additionally, due to problems with detection limits for some of the metals in the 1997 soils data, the development of BAFs was questionable for several of the COPCs. These data have since been re-evaluated and several BAFs were calculated. These BAFs were then evaluated in the form of a sensitivity analysis presented both in Appendix H3 and Section 17.



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16 (continued)				This study compared a limited number of site-specific BAFs to those used in the WAG ERAs, the OU 10-04 ERA, and the WAGs 6 & 10 ERA. The results of this study indicate that the use of literature-derived BAFs is more conservative and is appropriate for screening level ERAs. The results also supported the use of a consistent methodology for the WAG ERAs as well as the OU 10-04 and WAGs 6&10 ERAs.
17			<p>The following is an excerpt from the uncertainty discussion in Appendix F Risk Assessment Methodology.</p> <p>A great deal of uncertainty is associated with the bioaccumulation factors (BAFs) used to calculate dose. Very few BAFs are available in scientific literature because they must be both contaminant- and receptor-specific. The BAFs used for metals are discussed in Appendix H. The regression equation (Travis and Arms 1988) was used to calculate BAFs for the organic contaminants at WAGs 6 and 10 sites. An assumption that terrestrial receptors of concern accumulate metals and organics in a similar way and comparable degree to beef and dairy cattle was incorporated in the dose calculations. In the absence of specific BAFs, a value of 1 was assumed. This assumption could result in either an overestimate or an underestimate of the true dose from the contaminant, and the magnitude of error cannot be quantified. The terrestrial receptors of concern for WAGs 6 and 10 may accumulate organics to a much larger or smaller degree than beef and dairy cattle; therefore, using the regression equation (Travis and Arms 1988) also could result in either</p>	See response to Comment #16.



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			an overestimate or an underestimate of the dose from the COPCs.	
17 (continued)			<p>In addition, the use of BAFs, as discussed in Appendix H, could result in either an overestimate or an underestimate of dose to ecological receptors at the site in the absence of site-specific data.</p> <p>The ecological risk assessment does not adequately explain why site-specific bioconcentration and bioaccumulation factors were not derived from the collected tissue residue data and abiotic sampling media. Also, it does not appear as if the tissue residue (e.g., grasshopper, deer mice, cottontail and wheatgrass) data were included in the risk assessment appendices. These tissue residue data and co-located soil analytical data should, at the very least, be summarized and used to compare to literature derived bioaccumulation factors as part of the uncertainty analysis.</p>	

GENERAL COMMENTS (UXO)

18			<p>This document does not adequately or appropriately address the issues associated with the characterization and remediation of Ordnance and Explosives to include unexploded ordnance. The conceptual site model for this hazard (Fig. D-1 in Appendix D) does not address actual primary release mechanisms, potential secondary sources, or transport and migration mechanisms for UXO. An example of a more fully developed Conceptual Site Model (CSM) for this site may be found at Attachment 1 to these comments. These should also be addressed in each AOC found in Section 12. The ordnance areas covered by this document do not appear to have been adequately characterized (the locations, boundaries, ordnance type, condition and depth). The initial determination of the boundaries should list the uncertainty associated with them and mapped accordingly (e.g. high uncertainty with no ground truth of the boundaries should only have</p>	<p>Comment incorporated. As discussed in the Agency conference call of May 22, 2001, the characterization information for ordnance is limited, and we do not have the information now to reduce the uncertainty.</p> <p>Note: It was agreed, however, that additional summarizing information from the OU 10-03 Track 2 summary report would be helpful if added to Section 12.3. So, in addition to outlining past removal actions and adding the types of UXO found at each UXO location, the following paragraph has been added: "Multiple types of ordnance and explosives have been</p>
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			uncertainty with no ground truth of the boundary should only have dashed lines indicating the boundaries).	recovered from each INEEL ordnance site.
18 (continued)			The particular ordnance types and condition of the ordnance should be included. This information can be used as part of a site specific risk management process as well as part of the Institutional Control Management Plan.	To date, approximately 2,360 live items (UXO) have been removed and detonated, 310 kg (685 lb) of TNT and RDX have been removed and detonated, 90,000 kg (198,500 lb) of total scrap have been removed and landfilled, and 185 yd ³ of contaminated soil has been incinerated (Sherwood 1998). As mentioned above, UXO remains at the NODA, the Mass Detonation Area, the Experimental Field Station, the Railcar Explosion Area, the Land Mine and Fuze Burn Area, and more UXO items are found intermittently both at known sites and at previously unidentified sites.” We intend to address the remaining issues post ROD as part of the RD/RA at which time we will collect the data that will be used to determine the locations, boundaries, ordnance type, condition and depth.
19			The capabilities of the proposed geophysical survey technique (helicopter mounted magnetometers) of 252,000 acres should be described in greater detail. It may be limited by site geologic features and by the fact that the airborne systems typically are only be able to potentially find large targets of interests or mass concentrations, such as target areas. The necessary testing and proof of capability should be discussed.	A more detailed description of aerial geophysical survey techniques has been provided in the text, including capabilities and limitations.



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20			Section 12 only contains descriptions of previous UXO investigations in the soil contamination sites section (Section 12.4). These descriptions should be moved to the UXO sites section (Section 12.3), in order to allow the reader to more easily assess the conclusions presented in this section.	Comment incorporated as suggested.
21			Section 12.3 identifies 3 main types of ordnance related activities at these sites: gun testing, ordnance disposal, and aerial bombing practice. Analysis of these sites should include identification of areas of concern (AOCs) associated with these activities (e.g., primary release mechanisms and what kind of exposures would be expected for the type of ordnance related activity, for example-artillery firing points with potential for soil contamination from the propellant used to propel the ordnance down range, range safety fans with a potential for under/over shoots of the primary target(s) and target areas with potential for unexploded ordnance as well as soil contamination for the gun testing activities), determination of the location and boundaries of these AOCs, and determination of the nature and extent of the ordnance contamination located within the AOCs. Additionally, a more detailed Conceptual Site Model (CSM) for UXO with the type of expected contamination to be found in each of the potential areas should be included.	<p>Comment incorporated.</p> <p>As discussed in the Agency conference call of May 22, 2001, the characterization information for ordnance is limited, and we do not have the information now to reduce the uncertainty. It was agreed, however, that additional information from the OU 10-03 Track 2 summary report would be added to Section 12.</p> <p>Areas of concern have been identified to the extent possible based on the amount of past fieldwork approved by the Agencies, and some additional information has been added to Section 12 to clarify past actions.</p> <p>Only two firing points have been identified for the INEEL (CFA 633 and the NOTF), both of which were already addressed as individual sites. CFA-633 was addressed in an interim action in 1993 and is discussed in Section 12.4.1. At NOTF, a surface search was conducted as described in Table 12-1, no visual contamination or UXO was observed, and the site was not brought forward for evaluation in</p>



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				the FS.
21 (continued)				Numerous disposal craters have been located on the INEEL, but more are identified nearly every year that searches have occurred, not all have been located, and historical information is limited. As mentioned in the response to comment 18, additional characterization would be necessary to complete a more detailed CSM. Section 12.2 is an overview of the expected risks related to INEEL ordnance areas.
GENERAL COMMENTS (FEASIBILITY STUDY):				
22			The UXO areas should be listed so their locations are clear. It is not entirely clear from reading text in Sections 19 to 22, how areas with both UXO and soil contamination are addressed.	Comment incorporated. Text has been added in Section 19.1 to indicate the UXO areas include all land within the Down Range Area and Bombing Ranges as shown on Figure 19-3, INEEL Ordnance Map. In addition, Table 19-3 now lists the Down Range Area and Bombing Ranges.
23			Table 19-6 shows the initial screening of proposed technologies. None of these proposed technologies are screened out at this stage, which bases screening on effectiveness, implementability, and relative cost. However, many of these technologies are not included in the development of alternatives (Section 20). It appears that an additional screening step occurred to form the alternatives presented in Section 21 and evaluated in Section 22; this additional screening should be described in the text.	Comment incorporated. Table 19-6 has been revised to indicate that in-situ treatment and containment was screened out. The remaining technologies are not screened out; rather the most representative technology was used in development of the alternatives. This does not rule out consideration of these other technologies during remedial design and remedial action.



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24			The text mentions cultural resource surveys. It is not clear whether these surveys will occur before the remedy, what they entail, and whether they are included in the cost estimates in this FS. Please explain these factors.	Comment incorporated. Cultural resource surveys are conducted prior to disturbance of an area, and the costs are included in the cost estimate. Cultural resource surveys are required by the National Historic Preservation Act to assess the potential impacts of INEEL activities on cultural resources that are eligible or potentially eligible for nomination to the National Register of Historic Places. Cultural resources on the INEEL include prehistoric and historic archaeological sites, traditional cultural places important to the Shoshone-Bannock Tribes, and architectural properties important in US nuclear/scientific/Cold War history. Cultural resource surveys are completed as part of the Environmental Checklist process on the INEEL whenever proposed activities will disturb soil or extensively modify or demolish structures. Consultation with concerned Native American Tribes is also required under the law (National Historic Preservation Act) as well as the DOE-ID Agreement in Principle and is conducted with the Shoshone-Bannock Tribes in advance of all archaeological surveys. Tribal members from the DOE-ID Program Office often assist in the surveys. When sensitive cultural resources (of any kind) are identified in a proposed project area, we work with project managers to avoid or mitigate



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				adverse impacts to them.
24 (continued)				The Shoshone-Bannock Tribes and Idaho State Historic Preservation Office are also involved in this process and are legally afforded 30 working days to comment on our efforts to identify and protect cultural resources.
25			The text describes a helicopter-mounted array to detect UXO over large areas; this method is incorporated into Alternative 3 at areas with UXO (Section 22). The effectiveness of this method of detection at reliably detecting UXO should be more thoroughly described.	Comment incorporated. A more detailed description of aerial geophysical survey techniques has been provided in the text, including capabilities and limitations.
26			A table identifying further needs for specific alternatives, such as treatability studies, should be added, to provide the link to additional work and clarify the path forward.	Comment incorporated. The only alternatives that require a treatability study or demonstration prior to implementation of remedial action are soil washing and aerial UXO geophysical survey, which have been described in the text.

SPECIFIC COMMENTS (HUMAN HEALTH)

27	9.2	9-1	The second sentence of the second paragraph of this section contains a typographical error. The sentence reads "The results indicated the presence of Cs-137 pCi/g...".	Comment incorporated. We have removed "pCi/g" from the sentence.
28	9.2	9-2	Reference is made in this section to a Preliminary Remediation Goal (PRG) for an excavation that was completed in 1995 for this site. The basis for this PRG should be described. To avoid confusion, the Conclusions presented in Section 9.7 should clearly indicate that the PRG used for screening out of COPCs for this site is based on the removal action criteria.	Comment incorporated. Section 9.2 has been revised to add the reference for the PRG (Volume III of the OU 10-06 Engineering Evaluation/Cost Assessment), and we have revised Section 9.7 to state that the PRG was used to screen COPCs from this site.



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29	10.5.1 and 10.5.2	10-6	The overall noncarcinogenic hazards to future residents, current workers and future workers are described in this section as "significantly less than 1E-6". This may be a typographical error, since noncarcinogenic hazards are not usually evaluated at this level. In addition, Tables E1-13, E2-9, and E3-9 list values of 0.00+00 for LCCDA-01 and LCCDA-02 total hazard quotients. These tables indicate that noncarcinogenic hazard quotients were not calculated for these exposure scenarios for these areas. The text of this section should indicate why hazard quotients were not evaluated at LCCDA-01 and LCCDA-02. Any information pertaining to the lack of toxicity information to evaluate noncarcinogenic hazards should be discussed in the Uncertainties Section, 10.6.	Comment incorporated. No noncarcinogenic COPCs were retained for the HHRA for LCCDA-01 and LCCDA-02. Hazard quotients should not have been calculated for these sites. These sections have been rewritten to reflect these changes. Appendix E has also been updated and footnotes have been added to explain data gaps and replace zeros.
30	11.3	11-4	This section contains numerous typographical errors where "Ra-266" was used instead of "Ra-226". In addition, this section should address the question of whether any of the sites were identified as having Ra-226 as a possible contaminant based on operational history. The last sentence in this section should be modified. The background Ra-226 levels may indeed be a significant risk. The reason for screening out this radionuclide is that it is not present at levels different than background and there is no reason to believe it was part of operational discharges.	Comment incorporated. We have changed "Ra-266" to "Ra-226," and have added the statements below: Ra-226 is a daughter product of naturally occurring U-238. Ra-226 is rarely produced by manmade activities. The Ra-226 discussed here is a naturally occurring radioactive material (NORM) and was not a product of any known operational discharges. Additionally, Ra-226 neither is a fission byproduct nor is it an activation product. The naturally occurring levels of Ra-226 found at OMRE-01 pose only a marginal human health risk due to external exposure over a 30-year period, and will no longer be evaluated.



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31	11.4	11-8	The third bullet in this section describes vapor port results not included in the report. The last three sentences ("The results...OU 10-04 ROD" should be replaced with the sentence "Vapor port monitoring is ongoing."	Comment incorporated. We have replaced the last three sentences with the sentence, "Vapor port monitoring is ongoing."
32	11.5	11-8	This section should provide a description of the future action that will be necessary to eliminate the contamination at the four hotspots which were eliminated from the exposure point concentration determination.	Comment incorporated. However, no future action is necessary. We have instead included additional discussion and the results of RESRAD 6.0 modeling in Section 11. These "hotspots" were removed from the HHRA because even with the conservativeness in the modeling, no risk is shown for future residents.
33	11.5	11-8	The overall noncarcinogenic hazards to future residents, current workers and future workers are described in this section as "significantly less than 1E-6". See comments on Sections 10.5.1 and 10.5.2.	Comment incorporated. The overall noncarcinogenic hazard for all scenarios could not be evaluated due to lack of reference doses for benzo(a)pyrene and chrysene. This section has been rewritten to reflect this change. Appendix E has also been updated and footnotes have been added to explain data gaps and replace zeros.
34	11.7	11-1	The target risk range is listed as "10E-4 to 10E-6". This is typographical error should be corrected to read "1E-4 to 1E-6".	Comment incorporated.



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35	12.4.2.4.1	12-13	The estimated human health risk at the Experimental Field Station falls below the target "carcinogenic" risk of 1E-4 remediation levels for all exposure scenarios and pathways. Risks values within EPA's target risk range of 1 E-4 to 1 E-6 need to be considered during remediation planning. This sentence should be modified to state that risks are less than 1E-4 and within the target risk range.	Comment incorporated. We have revised the document to state that risks are within the target risk range.
36	12.4.2.4.1	12-17	The final paragraph in this section contains an error. The sentence that states "Total noncarcinogenic hazard to future residents is 1" is incorrect. The sentence should be corrected to indicate: "Total noncarcinogenic hazard to future workers is 1."	Comment incorporated.
37	12.4.4.5.1	12-26	The sentence that begins "Area 2, although it does not have COPCs for human health..." does not indicate that the carcinogenic risks being discussed are those for the future resident receptor. Please indicate the receptor whose risks are being discussed for "Area 2".	Comment incorporated. The carcinogenic risks being discussed in "Area 2" are for the future resident. This sentence has been rewritten to identify this receptor.
38	12-9	12-36	The hazard indices listed for the current and future worker for Area 2 should be verified. It appears that the inhalation of fugitive dust hazards have not been included in the total values.	Comment incorporated. The inhalation of fugitive dust hazards have now been included in the total hazard indices listed for the current and future worker.
39	12-16		The EPA Region IX Preliminary Remediation Goal for cadmium is not 3.9 E+1 as listed in Table 12-16. The correct PRG for cadmium is 3.7 E+1. A review of all screening tables should be performed.	Comment incorporated. The PRG for cadmium has been updated in all screening tables and associated sections and Appendices.



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40	12-17	12-74	The Area 4 hazard index listed for the current worker scenario does not correspond to the sum of hazard indices provided in Table E2-9. The Area 3 cancer risk listed for the future worker scenario does not correspond to the sum of cancer risks provided in Table E3-1. The Area 4 hazard index listed for the future worker scenario does not correspond to the sum of hazard indices provided in Table E3-9.	Comment incorporated. These tables have been updated to reflect the correct values.
41	12.5	12-80	This section should discuss whether significant ecological impacts have been observed over the past several decades during which contamination has been present.	This section just summarizes those sections that go forward from the ordnance sites into the FS. The ecological risk assessment results are discussed in each section. An overview or ERA issues for long term effects (based on the limited Breeding Bird Survey results and the Long-term vegetation map) are included in Section 17. The data to actually evaluate the ecological impacts of the presence of TNT and RDX at the site is not available. This is a long-term monitoring concern and is identified as such in Section 17.
42	14.3.1	14-1	Soil samples indicate a maximum arsenic concentration that is slightly in excess of background. The basis for elimination of arsenic as a COPC should be further justified. Additional statistical discussion regarding the range and variability of background compared to the arsenic maximum may be necessary.	Comment incorporated. The discussion of arsenic background levels in Appendix K will be cited as the basis for eliminating arsenic where appropriate in the report.
43	18-1	18-3	The cancer risk listed for the BORAX-Inhalation of Fugitive Dust pathway does not appear to be correct. This value should be verified with the information presented in Table E1-2 and correct any discrepancies.	Comment incorporated. These tables have been updated to reflect the correct values.



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44	19-5	18-7	The cancer risk listed for the BORAX-Inhalation of Fugitive Dust pathway does not appear to be correct. This value should be verified with the information presented in Table E2-2 and correct any discrepancies.	Comment incorporated. These tables have been updated to reflect the correct values.
45	D-1.1.3.1.2	D-10	The use of cancer slope factors for radionuclides is discussed in the first paragraph found on Page D-10. Reference to EPA's Health Effects Assessment Summary Tables (EPA 1994) is provided. HEAST was updated in 1997 and again in 1999. The text should confirm that radionuclide cancer slope factors utilized in calculations reflect the most current revision of HEAST.	Comment incorporated. The text now confirms that radionuclide cancer slope factors utilized in calculations reflect the most current revision of HEAST (1999).
46	D-1.1.3.1.3	D-12	The equation for calculation of the worker's dermal absorption intake should be presented on this page.	Comment incorporated. The equation was moved, and is now presented on the correct page.



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47	D-1.1.3.1.3	D-12	A generic gastrointestinal absorption efficiency (GI Absorption) factor of 0.05 is presented in this section. This factor is also presented in the Exposure Parameters tables found in Appendix E. Since the GI absorption value is chemical specific and should be presented for each individual COPC evaluated in the human health risk assessment, the rationale for using a generic factor should be included.	<p>Comment incorporated. The following text has been added to Appendix D:</p> <p>The GI was defaulted to 0.05 based on guidance in Appendix A of EPA (1989). This guidance states that a relatively conservative assumption for oral absorption in the absence of appropriate information would be 5 percent. Currently, Region 9 for their route-to-route extrapolations methods discusses the use of oral toxicity values for evaluating dermal exposures (EPA 1999). They state that for many chemicals, a scientifically defensible database does not exist for making this conservative an adjustment of the oral slope factor/RfD to estimate a dermal toxicity value. Region 9 uses the current guidance (USEPA 1999a), recommends that cadmium is the only contaminant requiring an adjustment factor. The 1999 Region 9 PRG calculations for cadmium are based on this adjustment. This risk assessment continued to conservatively apply the 5 percent adjustment.</p> <p>A statement to this effect will also be added to Appendix E tables.</p>



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48	D-1.1.3.5	D-17	Information in the text indicates that the permeability coefficients used in risk calculations for OU 10-04 are presented in Appendix E. The permeability coefficients could not be located in Appendix E. All toxicity and chemical specific data (such as permeability coefficients) should be provided in summary tables in Section D.	Comment incorporated. Permeability coefficients are included within the newly developed table added to Appendix E, as attachment E4.
49	APP E		The hazard quotient (noncarcinogenic) and carcinogenic risk tables presented in Appendix E list a value of 0E+00 for compounds that do not have reference doses and cancer slope factors. The "0E+00" should be removed from the tables and a footnote provided stating that these compounds have not been evaluated due to lack of available toxicity information. The "0.00+00" implies that a quantitative evaluation has been performed.	Comment incorporated. All zeros were taken out of the risk calculation tables, and several footnotes explaining results or limitations are now included to help clarify the tables.
50	Table E1-1		The "MORE" listed in this table is a typographical error. "MORE" should be "OMRE".	Comment incorporated.
51	19.5.5	19-22	The list of ex situ options in the first paragraph dose not include composting (19.5.5.7).	Comment noted. Composting consists of adding feedstocks and mixing the amended soil to promote biological degradation, as described in the text.



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52	19.5.6.1.1	19-25	Section 18.5 (p18-12) indicates that lead-contaminated soil at STF-02 Gun Range could be regulated under RCRA due to leachable concentrations of lead. It is not clear whether the leachable concentrations of lead exceed the hazardous waste characterization criteria. Section 19.5.6.1 (p19-24) indicates that the on-site CFA Landfill cannot accept wastes that fail the RCRA TCLP criteria. Section 19.5.6.1.1. (p19-25) indicates that the CFA Landfill is a remediation alternative for the lead-contaminated soils from the STF-02 Gun Range. It should be clarified in the description of this alternative that this is only an option for those soils which do not exceed the RCRA TCLP Lead criteria. Soil with lead concentrations exceeding the RCRA criteria cannot be disposed of at the CFA Landfill.	Comment incorporated. The third sentence of Section 19.5.6.1.1 has been modified to read "...and non-RCRA-hazardous lead contaminated soils and construction debris..."
53	Table 20-2	20-5	According to this table, options 3 and 4 do not include future groundwater monitoring to detect impacts to groundwater from the lead contaminated soil. Section 18.5 (p18-12) indicates that lead-contaminated soil at STF-02 Gun Range could be regulated under RCRA due to leachable concentrations of lead. Since lead leaching from the site soils could potentially impact groundwater at the site, additional justification should be included to support the exclusion of this monitoring from options 3 and 4.	Comment noted. Future groundwater monitoring will not be required if alternatives 3 or 4 are implemented, since all lead contaminated soil above risk levels would be permanently removed from the site (i.e., the source of potential groundwater contamination would be removed).

SPECIFIC COMMENTS (ECOLOGICAL):